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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,554	08/24/2006	Andreas Christel	76775.16	8607
Francis C Hand Carella Byrne Bain Gilfillan Cecchi Stewart & Olstein 5 Becker Farm Road Roseland, NJ 07068				
			EXAMINER LSTVOYB, GREGORY	
			ART UNIT 1796	PAPER NUMBER
			MAIL DATE 12/17/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/590,554

**Applicant(s)**

CHRISTEL ET AL.

**Examiner**

GREGORY LISTVOYB

**Art Unit**

1796

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 11-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The prosecution has been reopened based on Applicant's response on 6/19/2008. After consultation with USPTO Quality Assurance Specialist Gregory Mills rejection under 35 USC 103(a) based on Christel et al (W02004/055093) has been withdrawn.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 11-16, 18-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Schiavone (US 6284866) in combination with Encyclopedia of Polymer Sci and Tech, vol 2, page 518, herein Encyclopedia, and Pelletizing systems options for extrusion (Extrusion Auxiliary Services), herein Pelletizing Systems and Culbert et al (WO 03/031133 cited with equivalent US 7193032) herein Culbert and Palmer (US 6344539).

Schiavone discloses a method for the manufacture of a partially crystalline polycondensate (PET copolymer, see claim 1, meeting the limitations of Claim 6), comprising the following steps:

a) Manufacture of a polycondensate prepolymer melt with IV value of 0.25 to 0.4 dl/g (see claim 1, meeting the limitations of claim 7);

b) passing the melt through a nozzle and cutting the melt upon exiting from the nozzle to form solidified granulates; (see Example 2 and Column 7, line 60);

c) treating the granulates at a temperature sufficient to achieve a predetermined degree of crystallization;

d) subjecting the granulates a solid phase polycondensation to increase the molecular weight of the granulates, (see Claim 1, where IV increases up to at least 0.7 dl/g),

Note that both c) and d) processes take place simultaneously at high temperature, meeting the limitations of Claim 16).

Regarding claim 8, Schiavone teaches that solidification shall proceed in such a way that no crystal structure is obtained with excessively large crystallites, which would require high processing temperatures (see Column 8, line 55).

Regarding Claims 13 and 14, Schiavone discloses more than 94% of dicarboxylic acid component and about 98% of ethylene glycol (see claim 1)

According to MPEP 2144.5 in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re*

*Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.).

Therefore, it would have been obvious to a person of ordinary skills in the art that Schiavone's PET, having about 98% mol of ethylene glycol may have this ingredient at concentration slightly above 98% mol, Meeting the limitation of claim 14.

Schiavone does not teach the size of the granules and maintaining the average temperature of the granulates in degrees Centigrade in transition from step b.) to step c) above a value corresponding to 1/4 of the melting temperature  $T_m$  in degrees Centigrade.

Palmer teaches a process for crystallization of polyester (PET, having 100% of terephthalic acid and 100% of ethylene glycol) granules of diameter of 2mmX1mm (see Column 4, line 45) at 230C using fluidizing bed reactor (see Column 3, line 50). The position is taken that the above granule size effectively less than 2 mm.

According to Palmer's method, very thin skin of crystallized polymer forms (about 0.1 mm, see Claim 4) on the surface of the granula, whereas its core remains amorphous.

This phenomena results in the non-sticky particles (due to surface crystallinity) with high post-condensation rate (because main part of the polymer is amorphous).

Therefore, it would have been obvious to a person of ordinary skills in the art to prepare small granules and treat them at high temperature in order to create surface skin crystallinity, which creates favorable conditions for post-condensation.

In addition, Culbert discloses a process for controlling crystallization of polyesters (PET) with their water content. Culbert achieves the required crystallization by contacting PET with~ water, whereas the lowest temperature of PET treatment is 60C (Tm of PET is 240C) (see Example 1). At certain conditions (10min under boiling water, see Example 3) no visible crystallization occurs.

It would have been obvious to a person of ordinary skills in the art to use Culbert's pretreatment of palletized PET prepolymer in order to achieve low (less than 10%) degree of crystallization in order to avoid high processing temperatures.

In reference to claims 2 and 18, claiming granule size within the range of 0.4-1.7mm and 0.6-1.2 mm, the position is taken that granule size can be optimized for the polycondensation process.

There are two main factors, related to a particle size and degree of crystallinity, influencing post-polycondensation:

1. Stickiness of the particles, which increases with decreasing particle size and low-crystallinity;
2. Degree of crystallinity, which determines the post-condensation reaction rate.

It is clear to an artisan that the above parameters should be optimized. There are several factors, which determine this optimization, such as type of equipment used, grade of the final polymer (IV, degree of crystallinity, type of polymer, etc.).

Regarding Claims 3-5 and 11, Schiavone does not disclose that granulate is cut upon exit from a nozzle, use of circumferential knife and water jet.

Encyclopedia and Pelletizing System teaches standard granulation procedures with the above knife and water jet.

It would have been obvious to a person of ordinary skills in the art to use standard granulation technique, such as using nozzle with multiple holes, circumferential knife and water jet, since the related equipment and experience are broadly available.

In reference to Claim 15, Schiavone does not disclose 98-99% mol of terephthalic acid. Palmer teaches pure PET, which contain 100% of terephthalic acid component.

It would have been obvious to a person of ordinary skills in the art that Schiavone process, modified with Palmer is completely applicable not only for modified PET, but to a pure polymer itself.

Claim 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Schiavone in combination with Culbert, Encyclopedia, Palletized Systems and Duh et al (US 5478868) herein Duh.

Schiavone discloses a method for the manufacture of a partially crystalline polycondensate (PET copolymer , see claim 1, meeting the limitations of Claim 6), comprising the following steps:

- a) Manufacture of a polycondensate prepolymer melt with IV value of 0.25 to 0.4 dl/g (see claim 1, meeting the limitations of claim 7);
- b) passing the melt through a nozzle and cutting the melt upon exiting from the nozzle to form solidified granulates; (see Example 2 and Column 7, line 60);
- c) treating the granulates at a temperature sufficient to achieve a predetermined degree of crystallization;
- d) subjecting the granulates a solid phase polycondensation to increase the molecular weight of the granulates, (see Claim 1, where IV increases up to at least 0.7 dl/g),



Palmer teaches a process for crystallization of polyester (PET, having 100% of terephthalic acid and 100% of ethylene glycol) granules of diameter of 2mmX1mm (see Column 4, line 45) at 230C using fluidizing bed reactor (see Column 3, line 50).

The position is taken that ht above granule size effectively less than 2 mm.

Encyclopedia and Pelletizing System teaches standard granulation procedures with the above knife and water jet.

Culbert discloses a process for controlling crystallization of polyesters (PET) with their water content. Culbert achieves the required crystallization by contacting PET with~ water, whereas the lowest temperature of PET treatment is 60C (Tm of PET is 240C) (see Example 1).

Culbert discloses a process for controlling crystallization of polyesters (PET) with their water content. Culbert achieves the required crystallization by contacting PET with~ water, whereas the lowest temperature of PET treatment is 60C (Tm of PET is 240C) (see Example 1). At certain conditions (10min under boiling water, see Example 3) no visible crystallization occurs.

Schiavone, Palmer, Culbert, Encyclopedia, Palletized Systems do not disclose foamed polyester granules.

Duh discloses process, where foamed PEN prepolymer was prepared. Use of foamed prepolymer allows to decrease solid state polymerization temperature to achieve the same target of IV (see Column 6, line 40).

Therefore, it would have been obvious to a person of ordinary skills in the art to use foamed prepolymer allow to decrease solid state polymerization temperature to achieve the same target of IV.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY LISTVOYB whose telephone number is (571)272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rabon Sergent/  
Primary Examiner, Art Unit 1796

GL